Beam Halo in data: updates

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UniHH/DESY alignment meeting
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The Data Sample

- Run 142130:

  - /store/data/Run2010A/Cosmics/ALCARECO/v4/000/142/130/9693689A-3A9E-DF11-A3DE-0030487CD7C0.root

  - 14,542 events

  - 140,258 tracks

- Run 142130, only events with $1 \leq nTracks \leq 4$

  - rfio:/castor/cern.ch/user/p/parenti/ALCARECO/nTrk_1_4/skim_RUN142130.root

  - 5,836 evts

  - 9,166 tracks

Track selection - 1

- Number of selected tracks (no track selection yet):

  – all events, all tracks in the ALCARECO   140,258

  – all events with $1 \leq nTracks \leq 4$, all tracks   9,166

  – after TrackRefitterBHM* TrackerTrackHitFilter* ctfWithMaterialTracks* AlignmentTrackSelector* TrackRefitterBHM sequence   2,111

- ... applying the selection cuts in sequence:

  – $p \geq 2.5$ 1,018

  – $nHit \geq 8$ 994

  – nHitsPerSubDet.inENDCAPplus/minus≥ 1 571

  – $nLostHits \leq 2$ 567

  – $nHitDiffEndcaps \leq 2$ 402

  – $chi2n \leq 10$.   402

Track selection - 2

- Additional check: selected tracks in plain root (no refitting):

  - all events with $1 \leq nTracks \leq 4$ 9,166

  - && $p \geq 0.5$ 6,035

  - && $p \geq 1.0$ 4,610

  - && $p \geq 1.5$ 3,812

  - && $p \geq 2.0$ 3,174

  - && $p \geq 2.5$ 2,751

  - && $nHit \geq 8$ 1,111

- Reminder:

  - after TrackHitFilter and TrackRefitter, and the same p and nHit cuts, 994 tracks were left
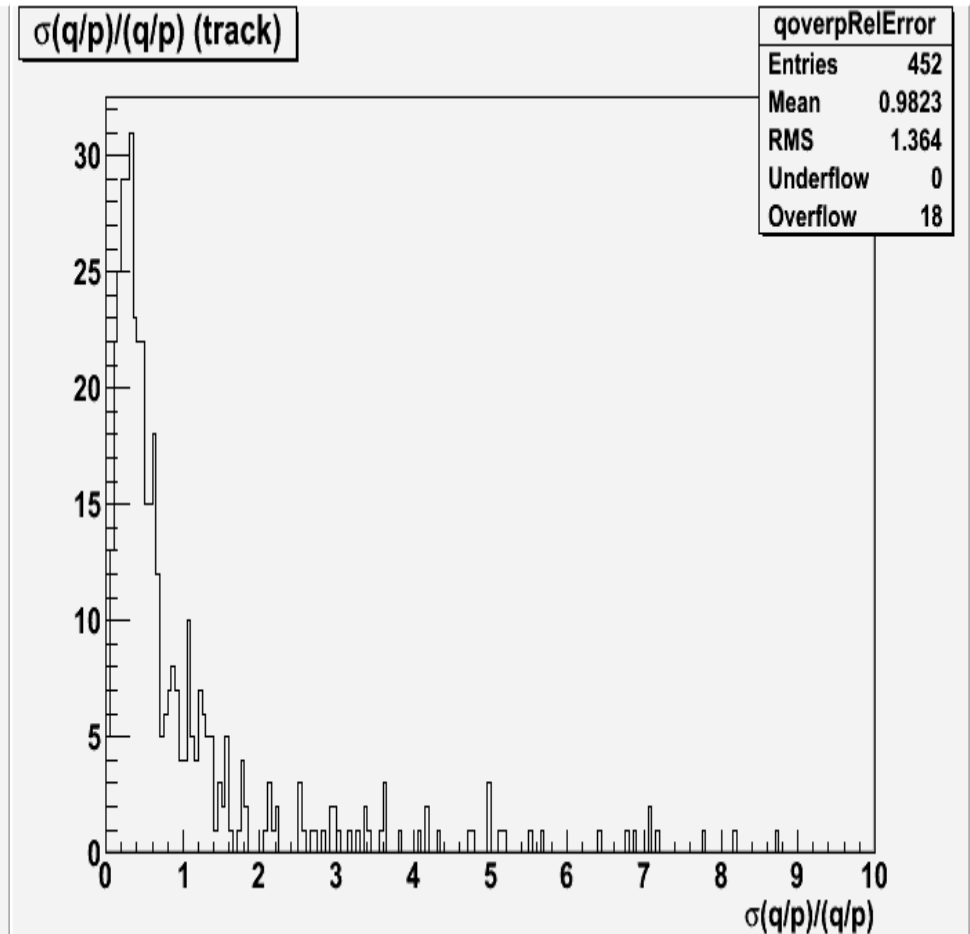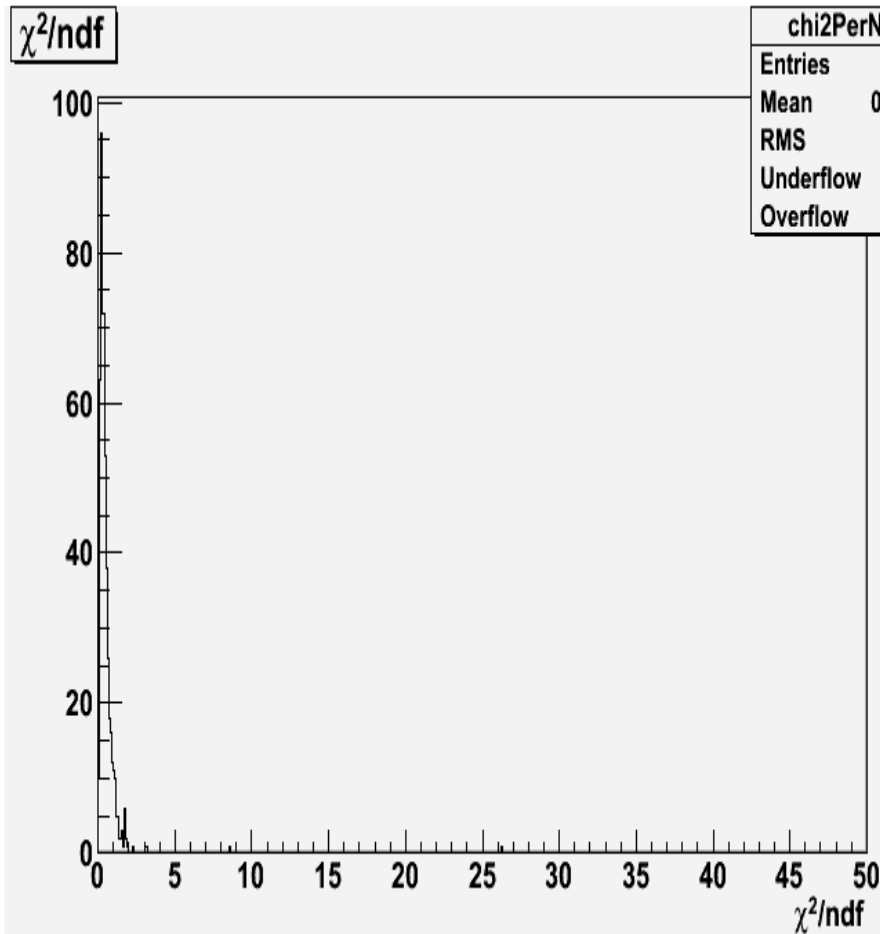
  - only 10% of "good tracks" rejected

Track selection - 3

- Additional check: releasing one single cut

  - released $1 \leq nTracks \leq 4$ 456

  - released $pMin \geq 2.5$ 422

  - released $nHit \geq 8$ 402

  - released nHitsPerSubDet.inENDCAPplus/minus≥ 1 402

  - released $nLostHit \leq 2$ 403

  - released $nHitDiffEndcaps \leq 2$ 402

  - released $chi2n \leq 10$.   402

  - changing sequence to AlignmentTrackSelector*TrackRefitterBHM, after all cuts   464

- Additional checks: effect of the trigger selection

  - 36 || 37 || 38 || 39   23

New Track selection

- nHitDiffEndcaps≤3   (instead of 2)

- chi2n≤20.   (instead of 10.)

  – Selected tracks: 452 (instead of 402)
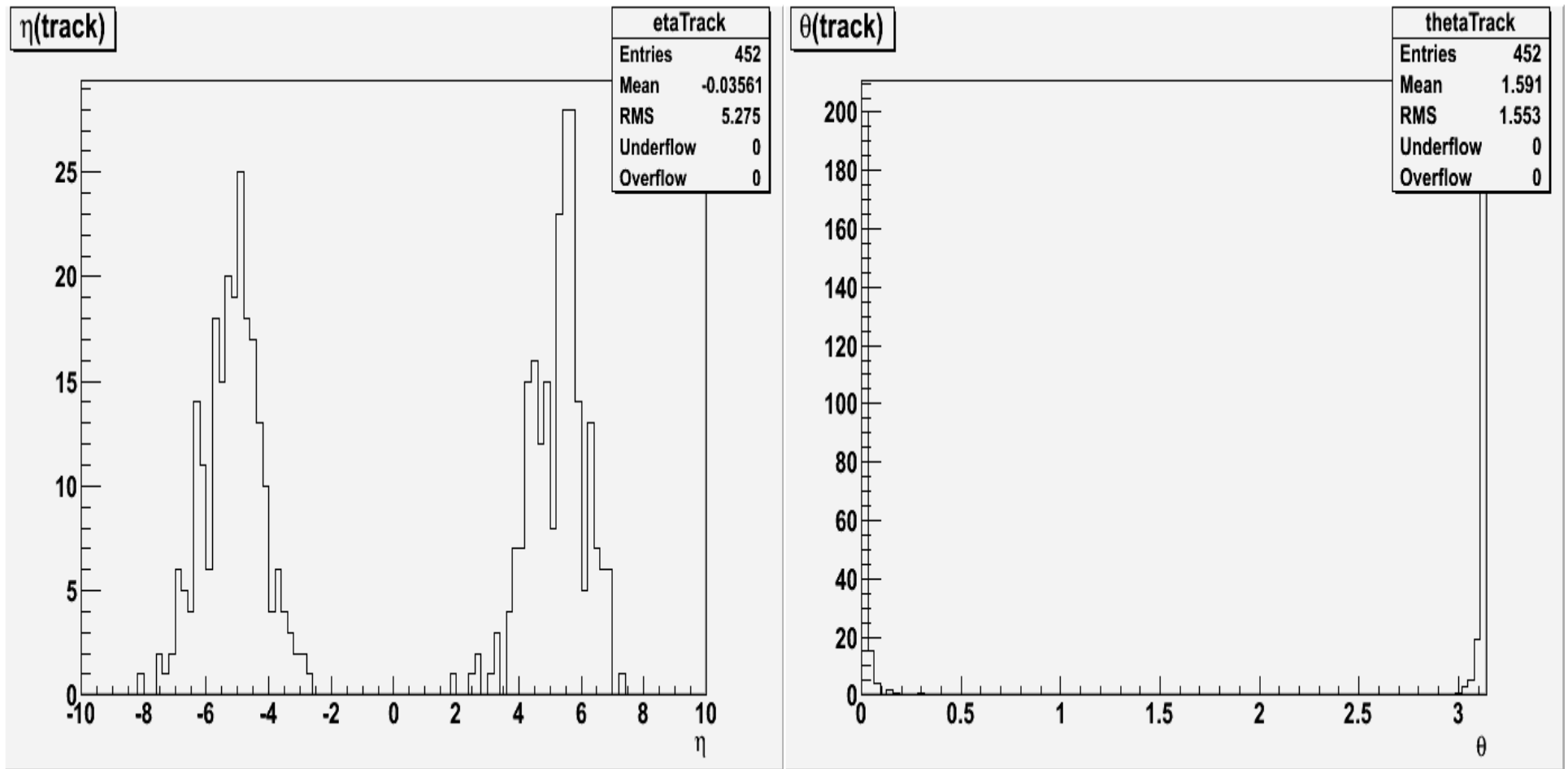
Conclusion

- It looks like the reduction in track statistics is mainly due to basic selection cuts (pMin=2.5, nHitMin=8)

    - is it reasonable to reduce the pMin? (rducing nHitMin whould have no effect, it is implicit when nHitsPerSubDet.inENDCAPplus/minus≥1)

- The other selection cuts are not rejecting so much

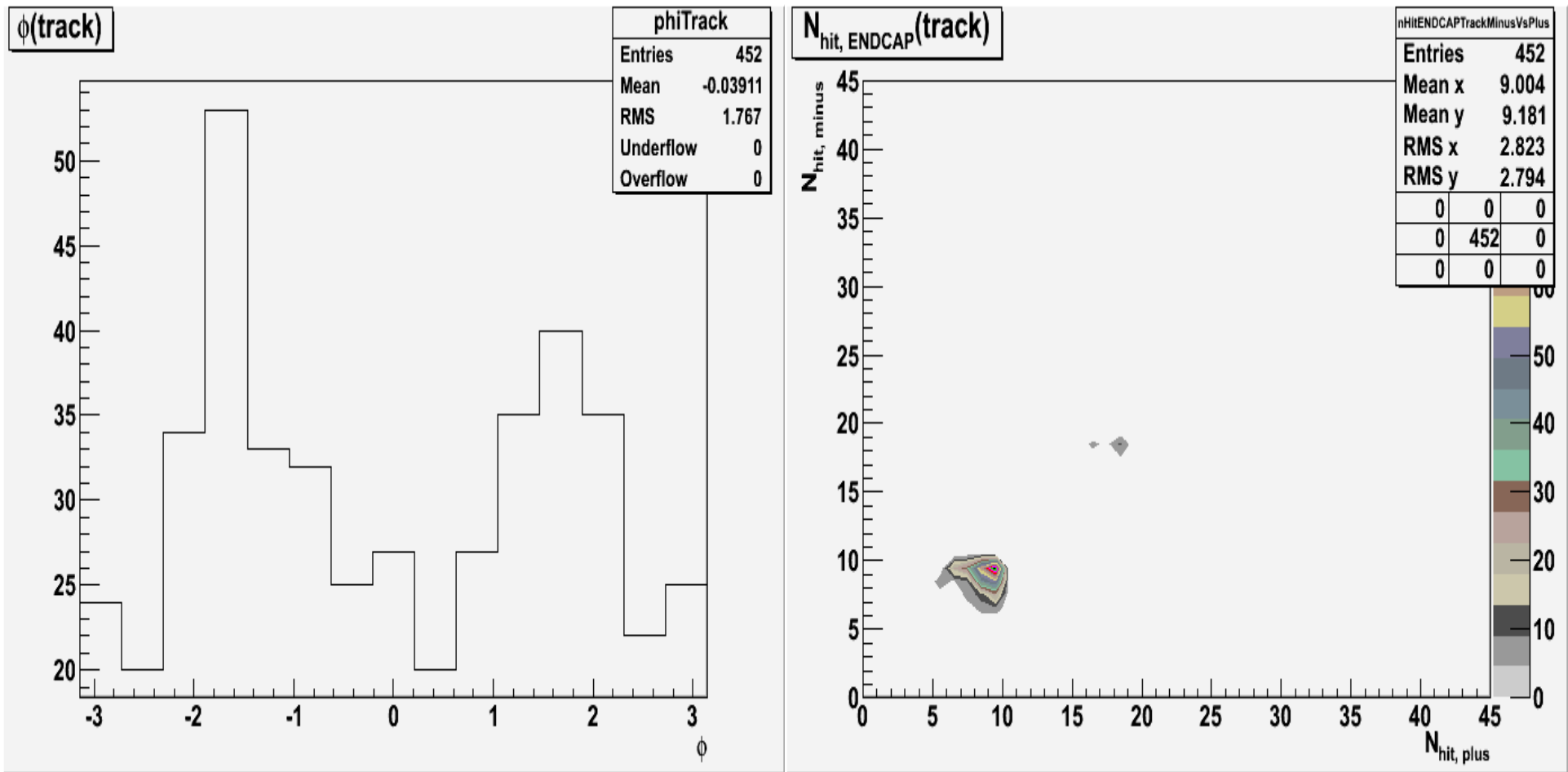- To do:

    - check on a larger sample

Additional slides

More distributions

More distributions

More distributions